



# K2 SERIES

## OPERATION AND MAINTENANCE MANUAL

CCTV PIPELINE INSPECTION SYSTEM  
P/N MD910, REVISION R043, 080120





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## CONTACT INFORMATION

**CUES**® equipment is designed to be easy to use during day to day operation. However, it is powered electrically and thus must be operated with care and safety. PLEASE READ THE INFORMATION ON SAFETY AND MAINTENANCE EVEN IF THE SYSTEM IS SET UP BY SOMEONE ELSE.

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### *More locations to serve you!*

**CUES**® Corporate Office  
3600 Rio Vista Avenue  
Orlando, Florida 32805  
800-327-7791  
407-425-1569 FAX

8am - 6pm EST M-Fri

**CUES**® Atlanta  
3755 Industrial Ct.  
NW, Suite 14  
Suwanee, GA 30024  
770-945-8674  
770-945-9604 FAX

8am - 5pm EST M-Fri

**CUES** West  
1943 S. Augusta Ct.  
Ontario, CA 91761  
909-923-2001  
909-923-2091 FAX

7<sup>AM</sup> - 6<sup>PM</sup> PST M-Fri

**CUES**® Northern California  
640 Eubanks Court, Suite C  
Vacaville, CA 95688  
Phone: 866-358-CUES  
Fax: 707-449-0260

8:00<sup>AM</sup> - 5<sup>PM</sup> PST M-Fri

**CUES**® MidWest  
2325 Parklawn Drive, Suite K  
Waukesha, WI 53186  
Phone:: 262-717-3165  
Fax: 262-717-3167

7AM - 4PM CST M-Fri

**CUES**® Canada  
1675 Sismet Rd., #2  
Mississauga, Ontario  
Canada L4W 1P9  
905-238-9178  
905-238-5018 FAX

8<sup>AM</sup> - 5<sup>PM</sup> EST M-Fri

**CUES** Northwest  
1000 NW Commerce Ct., Suite B  
Estacada, OR 97023  
Phone: 1.800.432.1549 ext: 403  
Fax: 909-923-2051

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Customer Service and ordering parts:  
800-854-CUES (800-854-2837)

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# K2 Series

## CCTV PIPELINE INSPECTION SYSTEM

This manual includes setup, operation, troubleshooting, and maintenance instructions for the CUES K2 Series Inspection System. CUES uses proven video technology to provide a versatile tool to assist with sewer line inspections.

If the unit is being used with an existing TV system, modifications might need to be made to the end of the TV cable and/or the truck's electrical wiring, depending on the specific system. If you're uncertain about the modifications required for the system or need more information regarding a retrofit, please call our Customer Service Department at 1-800-327-7791.



The K2 shown with the optional DV-1 Touch DVR.

K2 with DV-1 Touch	
MD920	KIT, DV-1 ASSY, K2

**K2 Series shown with an optional Compact Pipe Ranger Transporter.**



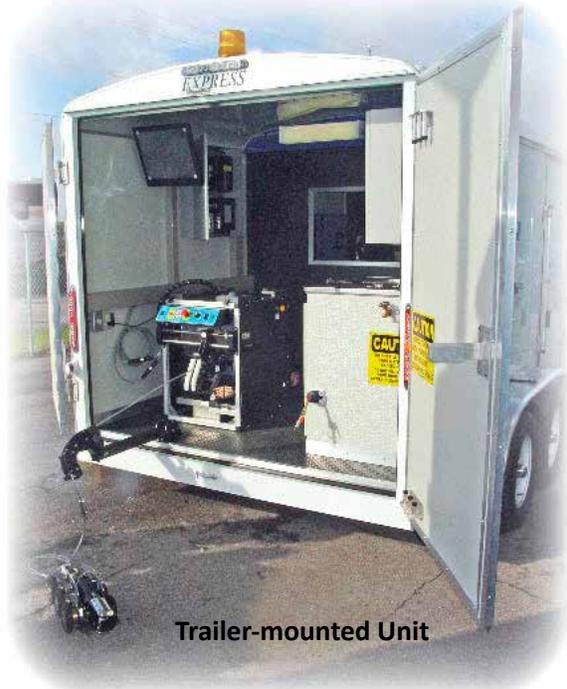
If using the optional DVR-SD recorder, refer to the Quick Guide P/N MS908 for additional instructions.

The K2 Base Station can be mounted in a wide range of vehicles, trailers, or used as a stand-alone system. The compact K2 Base Station is supplied with an ergonomic hand-held control that operates all CUES transporters and pan and tilt / zoom cameras.

K2 Base Station features built-in diagnostics for the entire system, including the video cable. The portable K2 video cable reel features automatic payout to minimize cable drag on the self propelled transporter / camera to maximize pull distance in the pipe. The K2 reel control console includes variable speed control, automatic levelwind, and an emergency shutoff. Increased video cable reel capacity is provided to maximize distance for each inspection run. Heavy-duty handles are supplied on the K2 Base Station and reel to facilitate portability. The K2 Base Station can be mounted on the built-in docking port of the video cable reel or staged independent from the reel. It includes a built in video overlay unit with programmable observation codes, alpha-numeric titling, and an on-screen distance display. K2 series options include Granite XP asset inspection / decision support software and DVD or digital recorders.

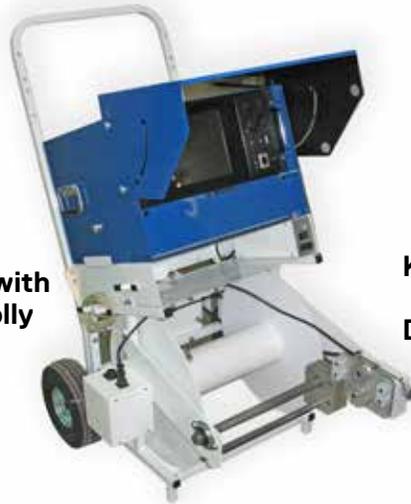


Optional Handles



Trailer-mounted Unit

**Optional K2 with Wheeled Dolly**



**K2 Dolly-mounted with Optional DVR-SD Recorder**



**THE K2 SERIES IS DESIGNED TO:**

- Operates as a complete multi-conductor inspection system.
- Obtains distance data with the user’s descriptions of defects and records them on DVD.
- Can interface with Granite XP or Granite Net, the pipeline data collection and real time video capture system, to allow the end-user to record on CD / DVD.
- Allows the operator to enter text in a free format screen. The system retains the last information entered on the location description page even when power is turned off. The display can be positioned anywhere on the monitor.
- A “Hand Command” remote control for full camera, transporter, reel and lights operation.
- Multiple choices of cables for push, pull, or transporter operation.
- Flexible enough to be used for inspection of lines from 2” in diameter and up.
- Can be used with any CUES camera or transporter
- System is available in English (future options: French & Spanish).
- System is compatible with the following keyboards: English (future options: French, Spanish, and Canadian).

WEIGHTS	
6U PCU CASE WEIGHT	77 LBS. FULLY LOADED
8U PCU CASE WEIGHT	94 LBS. FULLY LOADED
K2 REEL DOLLY (NO PCU CASE) W/1200 FT. OF PLATINUM CABLE, TIRES, AND HANDLES	204 LBS.
K2 REEL DOLLY (NO PCU CASE) WITHOUT CABLE, TIRES AND HANDLES	110 LBS.
1200 FT. OF PLATINUM CABLE ASSEMBLY	80 LBS.
HANDLES	8.4 LBS.
WHEELS	5.3 LBS.

	Weights (lbs)	Length (inch)	Width (inch)	Height (inch)
K2 IGGY DOLLY WITH 1000’ GOLD CABLE	323	47”	30.5”	46”
K2 IGGY DOLLY WITH 1000’ PLATINUM CABLE	279	47”	30.5	46”

## COMPONENT CONTROLS &amp; LOCATIONS



## POWER CONTROL UNIT

The K2 Series™ is a fully integrated and portable color TV system. It is capable of titling through the use of an alpha numeric data generator. The keyboard provides easy text input.

- 1 10.4" LCD
- 2 ARCHOS Digital Recorder
- 3 Keyboard
- 4 Antenna Connector (for CUES Hand Held Wireless Controller)
- 5 USB Port (Unassigned)
- 6 USB Port (for Game Pad Controller)
- 7 Boot-up LED (flashing during boot-up, steady after boot-up)
- 8 XLR Microphone Input
- 9 Lighted ON/OFF Switch
- 10 CUES Hand Held Controller Connector

## SIDE PANEL - REEL CONTROLS



The side panel reel control contains the following:

- 11** Main Power Switch for Manual Reel Controls
- 12** Auto-payout Indicator
- 13** Emergency Stop
- 14** Reel Speed Knob
- 15** Reel Direction Selector Switch
- 16** Manual Control Selector Button

The side panel reel control contains the following:

- 11** Main Power Switch for Manual Reel Controls - applies power to the manual reel control panel
- 12** Auto-payout Indicator - indicates the current status of the automatic cable payout function. CAUTION: when auto-payout is active (amber light is illuminated), the machine may move at any time.
- 13** Emergency Stop - disables all functions on the manual reel control panel.
- 14** Reel Speed Knob - controls the speed of the reel drum
- 15** Reel Direction Selector Switch - selects the direction of the cable movement:
  - IN: retrieves the cable on the drum
  - OUT: pays-out the cable, away from the reel
- 16** Manual Control Selector Button (momentary locking push button) - when activated, enables the functions on the manual reel control panel. The default position during the PCU power-up is ON.

# CUES K2/K3 SCREEN OPERATIONS: HELP MENU

Instructions for using the K2/K3 system are included in the HELP menu, which is accessible by pressing the F1 button at any time. The K2/K3 HELP system includes all of the information in Chapter 2 of the printed user manual.

## CUES HELP INDEX

```

===== CUES HELP INDEX =====

1. KEYS: ALL SCREENS?
   ALL SET UP SCREENS?
   RUN-TIME SCREEN1?
   RUN-TIME SCREEN2?
   RUN_TIME SCREEN3?
   FREE-FORMAT SCREEN?
   FREE FORMAT RUN-TIME SCREEN?
   TEST CONTROLLER HELP SCREEN?
   LAMPPII HELP SCREEN?
   GXP HELP SCREEN?
2. FIELD ENTRY HELP SCREEN?

<ENTER> to all screens
STATUS LINE - displays the action to be
performed in each field.
    
```

Press F1 at any time to access the HELP screen.

## KEYS FOR ALL SCREENS

```

===== CUES KEYS FOR ALL SCREENS =====

<F1> ----- TO HELP INDEX SCREEN
<CTRL><F2> ----- CLEAR COMMENT FIELDS
<CTRL><F4> ----- CLEAR FREE FORMAT SCN
<CTRL><F5> ----- CLEAR INSP. SETUP SCN
<CTRL><F6> ----- CLEAR ALARM
<CTRL><F7> ----- TOGGLE MUTE/UNMUTE
<CTRL><F10> ----- DEFAULT COMMENT SET

<CTRL><ALT><t> --- DISABLE/ENABLE TITLER
<CTRL><ALT><s> --- DISABLE/ENABLE STATUS
<CTL><ALT><UPARROW> SPEAKER VOLUME UP
<CTL><ALT><DNARROW> SPEAKER VOLUME DOWN
<CTRL><ALT><+>---- LOG SCREEN

<ESCAPE> previous screen
    
```

## KEYS FOR ALL SET UP SCREENS

```

== CUES KEYS FOR ALL SET UP SCREENS ==

<ENTER> - SELECT ACTION/HILIGHT NEXT FLD
<UPARROW> --- PREV SELECTION/FIELD
<DOWNARROW> - NEXT SELECTION/FIELD
<LEFTARROW> - MOVE CURSOR LEFT
<RIGHTARROW> MOVE CURSOR RIGHT
<DELETE> ---- DELETE AT CURSOR
<BACKSPACE> - DELETE LEFT OF CURSOR
<CTRL><DELETE> - CLEAR ENTRY
<TAB> ----- HIGHLIGHT NEXT FIELD
<SHIFT><TAB> HIGHLIGHT PREVIOUS FIELD
<SPACEBAR> -- TOGGLE TWO SELECTIONS
<CTL><ALT><INSERT> - RESTORE SCREEN
<INSERT> - TOGGLE OVERWRITE/INSERT

<ESCAPE> previous screen
    
```

## KEYS FOR RUN-TIME SCREEN1

```

=== CUES KEYS FOR RUN-TIME SCREEN1 ===

<SHIFT><F1> ---- TOGGLE COMMENTS ON/OFF
<SHIFT><F2> ---- TOGGLE OBSERVATN ON/OFF
<SHIFT><F3> ---- TOGGLE INCLINE ON/OFF
<SHIFT><F4> ---- TOGGLE ARROW ON/OFF
<SHIFT><F5> ---- TOGGLE TITLE ON/OFF
<SHIFT><F6> ---- TOGGLE DATE ON/OFF
<SHIFT><F7> ---- TOGGLE TIME ON/OFF
<SHIFT><F8> ---- TOGGLE MANHOLES ON/OFF
<SHIFT><F9> ---- TOGGLE PRESSURE ON/OFF
<SHIFT><F10> --- TOGGLE DISTANCE ON/OFF
<F11> ----- TOGGLE TRANS SPD ON/OFF
<CTRL><F11> --- TOGGLE DIRECTION ON/OFF
<CTRL><F12> ---- TOGGLE LENGTH ON/OFF
ARROW-LF/RT ---- MOVE FIELDS/ARROW LF/RT
ARROW-UP/DN ---- MOVE FIELDS/ARROW UP/DN

<ESCAPE> previous menu
    
```

## KEYS FOR RUN-TIME SCREEN2

```

=== CUES KEYS FOR RUN-TIME SCREEN2 ==

<F1> --- TO/FROM HELP SCREENS
<F2> --- TO/FROM EQUIPMENT CONFIGURATION
<F3> --- TO/FROM FREE-FORMAT SCREEN
<F4> --- TO/FROM FREE-FORMAT W/RUN SCRN
<F5> --- TO/FROM INSPECTION SETUP SCREEN
<F6> --- TO/FROM DISPLAY SETUP SCREEN
<F7> --- TO/FROM DIAGNOSTICS MENU SCREEN
<F8> --- TO/FROM REMINDER SETUP SCREEN
<F9> --- TO/FROM COMMENT DEFINITION SCRN
<F10> -- TO CONFIGURE REELS SCREEN
<CTRL><i>- ZERO INCLINATION
<CTRL><p>- ZERO PRESSURE
<CTRL>-<d>/<z>- PRESET/ZERO DISTANCE
<SHIFT><HOME> HOME FIELDS
<SHIFT><INSERT>TOGGLE ALL FIELDS ON/OFF

<ESCAPE> previous menu
    
```

## KEYS FOR RUN-TIME SCREEN3

```

=== CUES KEYS FOR RUN-TIME SCREEN3 ==

<CTRL><f> ----- TOGGLE FONT RENDERINGS

There are two ways to input observations
either <ENTER> and
use arrow keys to see stored comment fields,
or input a code
and it will display the comment. After
either,<ENTER>will save
the observation. These work for FreeFormat
w/RunTime also.

<ENTER> ----- TO ENTER COMMENTS MODE
ARROW UP/DN - DISP. PREV/NEXT COMMENT
<ENTER> ----- SAVE THIS COMMENT
<A-Z> ----- INPUT CODE/GET COMMENT
<ENTER> ----- SAVE THIS COMMENT

<ESCAPE> previous menu
    
```

## CUES K2/K3 SCREEN OPERATIONS: HELP MENU

Instructions for using the K2/K3 system are included in the HELP menu, which is accessible by pressing the F1 button at any time. The K2/K3 HELP system includes all of the information in Chapter 2 of the printed user manual.

### KEYS FOR FREE-FORMAT SCREEN

```
== CUES KEYS FOR FREE-FORMAT SCREEN =

<ENTER> ----- CARRIAGE RETURN/LINE FEED
<UPARROW> --- MOVE CURSOR UP
<DOWNARROW> - MOVE CURSOR DOWN
<LEFTARROW> - MOVE CURSOR LEFT
<RIGHTARROW> MOVE CURSOR RIGHT

<DELETE> ---- DELETE SELECTION AT CURSOR
<BACKSPACE> - DELETE LEFT OF CURSOR
<TAB> ----- SPACE TO NEXT TAB STOP
<CTRL><b> --- BEGIN TEXT BLOCK SELECTION
<CTRL><c> --- COPY SELECTED TEXT BLOCK
<CTRL><x> --- CUT SELECTED TEXT BLOCK
<CTRL><v> --- PASTE SAVED TEXT BLOCK
<CTRL><f> --- TOGGLE FONT RENDERINGS

<ESCAPE> previous menu
```

### KEYS FOR FREE-FORMAT WITH RUN SCREEN

```
=== CUES FREE FORMAT W/RUN SCREEN ===

<CTRL><f> ---- TOGGLE FONT RENDERINGS
<UPARROW> ---- MOVE RUN-TIME GROUP UP
<DOWNARROW> -- MOVE RUN-TIME GROUP DOWN
<LEFTARROW> -- MOVE RUN-TIME GROUP LEFT
<RIGHTARROW> - MOVE RUN-TIME GROUP RIGHT
<SHIFT><F2> -- TOGGLE OBSERVATION ON/OFF
<SHIFT><F4> -- TOGGLE ARROW ON/OFF

<ESCAPE> previous menu
```

### CUES GXP HELP

```
===== CUES GXP HELP =====

<CTRL><f> ----- TOGGLE FONT RENDERINGS
<ALT><CTRL><g> - TO/FROM EQUIPM CONFGRTN
<F1>          --- HELP

<ESC>        --- MAIN MENU
```

- Press **<CTRL><f>** to cycle through the font renderings. There are four selections: **EBW, HBW, WWB, BBW**. The three letters are abbreviations for the background color, outline color and character color used for the text that is overlaid on the video display. E refers to external, meaning that the video is passed through (transparent). W refers to white, B refers to black and H refers to half-tone.
- Press **<ALT><CTRL><g>** to move to/from the Equipment Configuration screen.
- Press **<F1>** to display the GXP Help screen.
- Press **<ESC>** to move to the main menu.

### CUES LAMP II HELP

```
===== CUES LAMP II HELP =====

The following hot keys are only valid
when the LAMP II Transporter/Camera are
being used.

<ALT><F10> ----- TOGGLE LATERAL DISTANCE
<ALT><CTRL><v> - TOGGLE VIEW MAIN/LAMP II
<ALT><d> ----- PRESET LATERAL DISTANCE
<ALT><z> ----- ZERO LATERAL DISTANCE

The following only work with the Micro
Pan & Tilt
<SHUTTER>+<DPAD +/>- Raise/Lower floods
<IRIS>+<DPAD +/>- Raise/Lower spots

<ESCAPE> previous menu
```

### CUES TEST CONTROLLER HELP

```
===== CUES TEST CONTROLLER HELP =====

The following hot keys are only valid
on the Test Controller screen.
```

```
<CTRL><ALT><j>- SAVE XPORT JOYSTICK OFFS
```

- Press **<CTRL><ALT><j>** to save the values of the gamepad transporter analog sticks. The negatives of these values will then be added to all gamepad transporter analog stick values until the next power cycle of the system. This feature is to be used only if the gamepad's analog sticks are exhibiting 'creep', whereby when at rest, there values are not close enough to zero.

### CUES CUTTER HELP

```
===== CUES KEYS FOR CUTTER =====

Left joystick vert : UP/DN CUT
Right joystick horz : CCW/CW CUT
Right joystick vert:FWD/REV CUT DRV
IRIS+DPAD +/- : Raise/lower UP/DN CUT
SHUTTR+DPAD +/- : Raise/lower CCW CUT
FOCUS+DPAD +/- : Raise/lower FWD/REV CUT
LIGHTS+DPAD +/- :Raise/lower flood lgts
LIGHTS+DPAD 0/1 : Raise/lower spot lgts
DIAGNOSTICS+DPAD +/- : Pan up/down
ZOOM+DPAD +/- Focus near/far
Right joystick button : Pan home
VIEW : Toggle camera view
LIFT : Toggle btwen cut/drive on FWD/REV
F11 : Toggle display of cut speed %

<ESCAPE> previous menu
```

# CUES LOGITECH GAME PAD FUNCTIONS

WHEN USING A CUES TRANSPORTER/CAMERA

(If using a LAMP II OR CURRAHEE CUTTER, refer to Quick Card P/N's LM912 & CK912)



- PLUS BUTTON - USE SIMULTANEOUSLY WITH DIFFERENT BUTTONS TO PERFORM VARIOUS FUNCTIONS
- 0
- 1
- MINUS BUTTON - USE SIMULTANEOUSLY WITH DIFFERENT BUTTONS TO PERFORM VARIOUS FUNCTIONS



- PRESS TO TOGGLE BETWEEN THE FRONT-VIEW, LATERAL, AND REAR-VIEW CAMERAS
- PRESS IN COMBINATION WITH THE DPAD + TO RAISE THE CAMERA LIFT
- PRESS IN COMBINATION WITH THE DPAD - TO LOWER THE CAMERA LIFT
- PRESS IN COMBINATION WITH THE DPAD 1 TO SAVE THE CRUISE CONTROL VOLTAGES

# CUES LOGITECH GAME PAD FUNCTIONS

WHEN USING A CUES TRANSPORTER/CAMERA

(If using a LAMP II OR CURRAHEE CUTTER, refer to Quick Card P/N's LM912 & CK912)



WHILE PRESSING THE IRIS BUTTON, SIMULTANEOUSLY PRESS THE PLUS / MINUS BUTTONS TO OPEN/CLOSE THE IRIS

WHILE PRESSING THE SHUTTER BUTTON, SIMULTANEOUSLY PRESS THE PLUS OR MINUS BUTTONS TO SHUTTER FAST/SLOW TO ENABLE VISIBILITY IN LOW-LIGHT CONDITIONS

WHILE PRESSING THE FOCUS BUTTON, SIMULTANEOUSLY PRESS THE PLUS OR MINUS BUTTONS TO FOCUS THE CAMERA NEAR/FAR. ALSO, PRESS THE FOCUS BUTTON AND THE "ON" BUTTON SIMULTANEOUSLY TO AUTO-FOCUS

WHILE PRESSING THE ZOOM BUTTON, SIMULTANEOUSLY PRESS THE PLUS OR MINUS BUTTONS TO ZOOM THE CAMERA IN/OUT



USE THE JOYSTICK TO MOVE THE TRANSPORTER. PRESS TO STOP THE TRANSPORTER.

USE THE JOYSTICK TO MOVE THE CAMERA. PRESS TO MOVE THE CAMERA TO THE HOME POSITION.

WHEN MOVING THE JOYSTICKS, NO VOLTAGE WILL BE APPLIED UNTIL THE OPERATOR HAS MOVED THE JOYSTICK APPROXIMATELY 20% AWAY FROM THE CENTER. THIS MAKES IT SO THAT THE TRANSPORTER DOESN'T HAVE ANY VOLTAGE APPLIED UNTIL THE OPERATOR ACTUALLY WANTS TO MOVE THE TRANSPORTER.

# CUES LOGITECH GAME PAD FUNCTIONS

WHEN USING A CUES TRANSPORTER/CAMERA

(If using a LAMP II OR CURRAHEE CUTTER, refer to Quick Card P/N's LM912 & CK912)

WHILE PRESSING THE REEL BUTTON, SIMULTANEOUSLY PRESS THE PLUS OR MINUS BUTTON TO MOVE THE REEL FASTER / SLOWER SPEED

PRESS THE REEL AND "ON" BUTTONS SIMULTANEOUSLY FOR PAYOUT MODE

PRESS THE REEL AND "OFF" BUTTONS SIMULTANEOUSLY FOR RETRIEVE MODE



WHILE PRESSING THE LIGHTS BUTTON, SIMULTANEOUSLY PRESS THE PLUS OR MINUS BUTTON TO ILLUMINATE THE EXTERNAL LIGHTS BRIGHTER OR DIMMER

PRESS THE LIGHTS AND ON / OFF BUTTONS TO TURN THE INTERNAL LIGHTS ON/OFF

PRESS IN COMBINATION WITH THE DPAD 1 TO TURN CRUISE CONTROL ON  
PRESS IN COMBINATION WITH THE DPAD 0 TO TURN CRUISE CONTROL OFF  
PRESS IN COMBINATION WITH THE DPAD + TO RAISE THE CRUISE CONTROL VOLTAGE  
PRESS IN COMBINATION WITH THE DPAD - TO LOWER THE CRUISE CONTROL VOLTAGE

PRESS TO DISPLAY THE INTERNAL DIAGNOSTICS SYSTEM.

## XBOX 360 CONTROLLER FUNCTIONS

The Xbox 360 Controller functions are identical to those of the Logitech Gamepad, aside from the exceptions shown below.



1. 'GUIDE' button: To turn the controller on, press and hold down this button until the ring of LEDs around it begin flashing. The flashing will stop, and the LED in the top-left quadrant will remain lit when the controller is connected to the system.
2. The two 'CONNECT' buttons (one on the wireless receiver and one on the controller): To connect the controller to the system, perform the following steps. NOTE: This is only necessary if the ring of LEDs around the 'GUIDE' button are flashing continuously.
  - a. Make sure that the wireless receiver is plugged into a USB port on the K2/K3 and its LED is lit.
  - b. Press and hold down the 'CONNECT' button on the wireless receiver until its LED begins flashing.
  - c. Press and hold down the 'CONNECT' button on the controller until the ring of LEDs around the 'GUIDE' button start spinning. The controller is connected to the system when the LEDs stop spinning, flash a few times, and the one in the top-left quadrant remains lit.

Several wired and wireless controllers will work with the system and may be available in a critical situation from a local electronics vendor, such as a Radio Shack, Best Buy or Walmart. However, only controllers purchased through CUES will have labels and are guaranteed to have been tested with the system.

The controllers that will work with the K2/K3:

- Wired Logitech Dual-Action
- Wired Logitech RumblePad 2
- Wired Microsoft Xbox 360
- Wireless Logitech RumblePad 2
- Wireless Microsoft Xbox 360
- Logitech Wireless F710
- Logitech Wired F310

Note that this also gives the priority that controllers are given, in the event that more than one is connected to the K2/K3 at a time. (It's common for customers to have both a wireless and a wired controller available. If the batteries go dead on the wireless, the wired controller can still control the transporter, camera and lights). The system will read the highest priority controller if more than one is connected at a time. Every two seconds the system detects if any controller has been connected or disconnected and determines which controller should be read from.

## CAMERAS

The K2 Series can operate the following CUES color cameras. Each camera is designed to work with different configurations and will vary depending on your specific equipment configuration. For more information, please refer to the *Equipment Configuration Screen* section in this manual.

- Quick ZoomCam
- Lite Stick
- LAMP II - Small Wheel & LAMP II Large Wheel
- ProScout II Mini Camera (PS2)
- ProScout III Mini Camera (PS3)
- Self-upright Mini Camera
- OZ Pan Tilt & Optical Zoom Camera
- Nite Lite Pan & Tilt Camera
- Night Owl Pan & Rotate Camera
- Panther Pan & Rotate Camera
- DUC
- PS3 on LAMP I
- Aries Seeker (Non Cues)
- IMX
- Lateral MPT
- DUC W/External lights

## TRANSPORTERS

The K2 Series can operate the following CUES transporters. Each transporter is designed to work with different configurations and will vary depending on your specific equipment configuration. For more information, please refer to the *Equipment Configuration Screen* section in this manual.

- WTR
- LAMP II - Small Wheel & LAMP II Large Wheel
- Pipe Ranger
- Compact Pipe Ranger WM350 HI-V
- Compact Pipe Ranger WM360 60V
- Steerable Pipe Ranger
- Pipe Ranger
- Shorty
- Ultra Shorty
- Ultra Shorty 21
- Ultra Shorty III
- Mudmaster
- Steerable Mudmaster
- Koala
- Badger NS

## CONNECTING THE SYSTEM

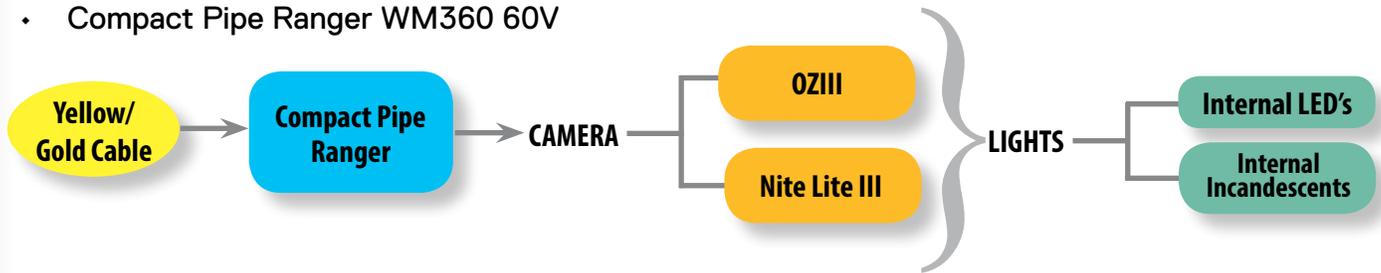
1. Place the K2 PCU (MD340) on top of the K2 reel (MD330). The PCU can be mounted in four different orientations. When placing the PCU on the reel, ensure that the reel cables are routed towards the rear of the PCU.
2. Latch the PCU to the reel on all four corners.
3. Remove the front and rear covers from the PCU case.
4. Connect the 12 & 19 pin reel connectors to the back of the PCU.
5. Plug the reel power cord into the PCU power strip. Note: for remote operations, extension cables must be used.
  - (MD309 & MD310 are 4 feet long)
  - (MD309-1 and MD310-1 are 15 feet long)
  - (MD309-2 and MD310-2 are 30 feet long)
6. If using a Gamepad controller, connect it to the lower USB port at the front of the controller (if the controller is wireless, connect the receiver to the lower USB port).
7. If using a CUES controller, connect it to the controller connector at the front of the PCU.
8. If using a CUES stand-alone controller, plug it into the “ext. Camera controller” jack at the back of the PCU and plug the power cord to the power strip.
9. If the microphone is to be used, plug it into the microphone jack at the front of the PCU. NOTE: in order to hear the microphone audio through the built-in speaker, the VCR audio out and the VCR audio in must be looped through: either via a VCR, DVD, DVR or cable.
10. Ensure that the PCU and reel power switches are in the OFF position.
11. Connect the power strip plug to the supplied extension and plug the extension to an AC power source. If using the K2 PCU remotely, connect the supplied power extension to the power strip and plug the reel plug to the extension.
12. An external monitor can be plugged into the “Int. Video out” BNC connector.
13. If using Granite XP or GraniteNet, connect the Granite computer to the RS232 port in the back of the K2 PCU.
14. Connect the transporter, camera, and lights to the cable end. NOTE: for additional setup instructions, please refer to the transporter and/or camera user’s manual for your specific system.



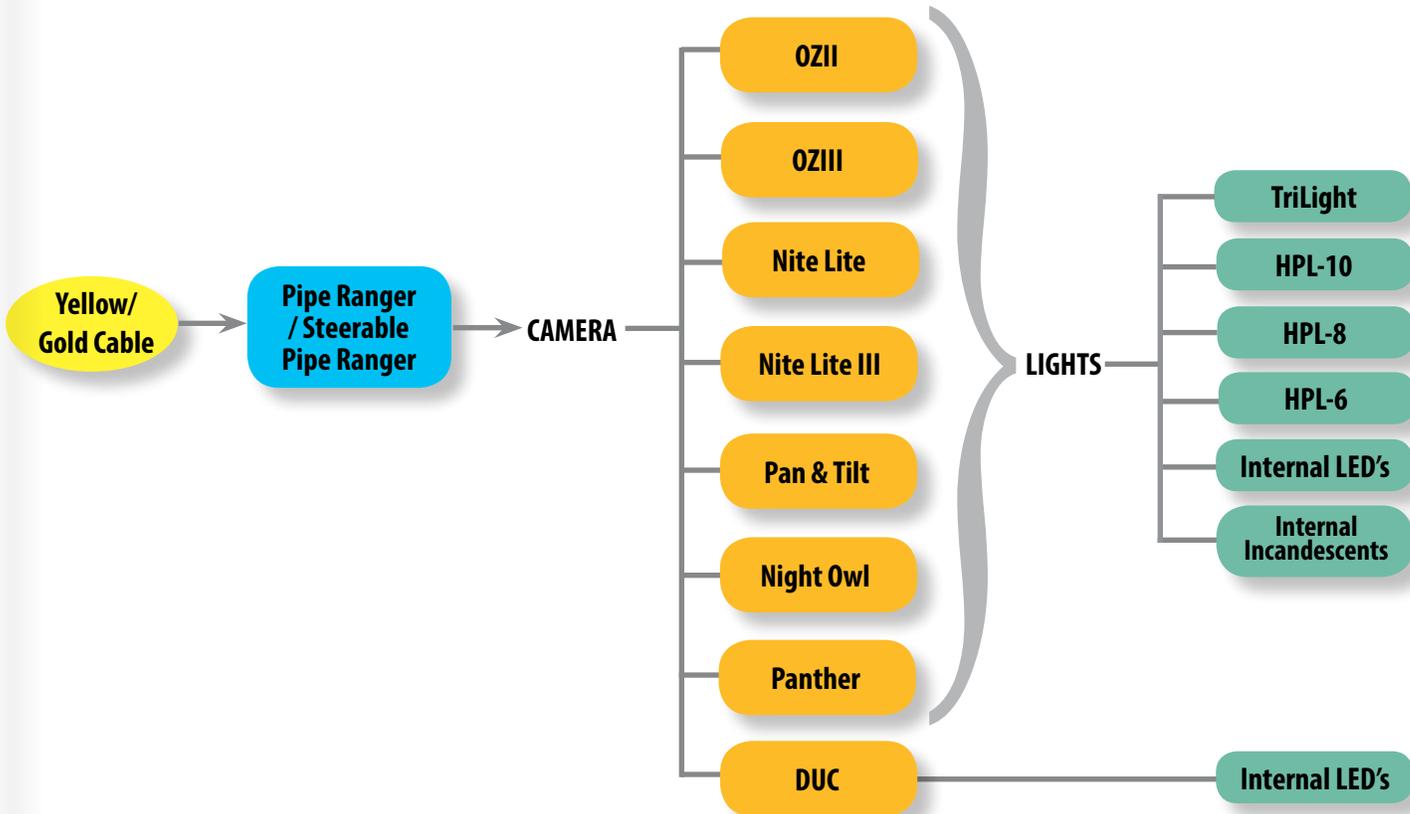
### PIPE RANGER SERIES *Gold Cable ONLY*

#### Gold Cable & Compact Pipe Ranger (CPR) ONLY

- Compact Pipe Ranger WM350 HI-V
- Compact Pipe Ranger WM360 60V



#### Gold Cable & Pipe Ranger / Steerable Pipe Ranger ONLY

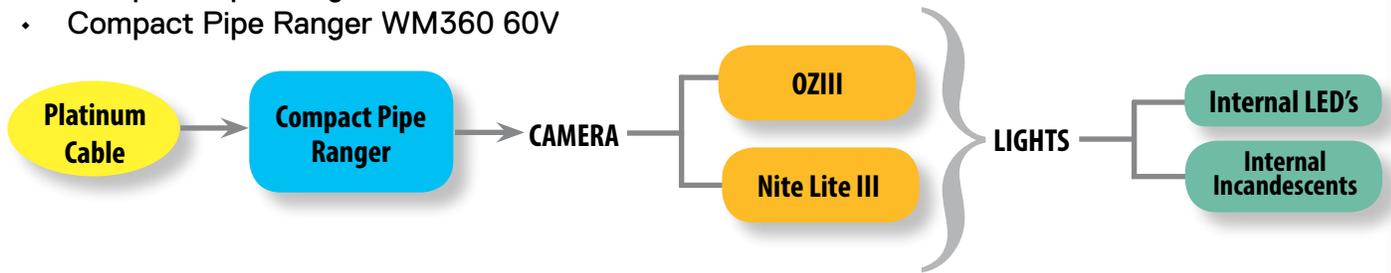


# PIPE RANGER SERIES *Platinum Cable ONLY*

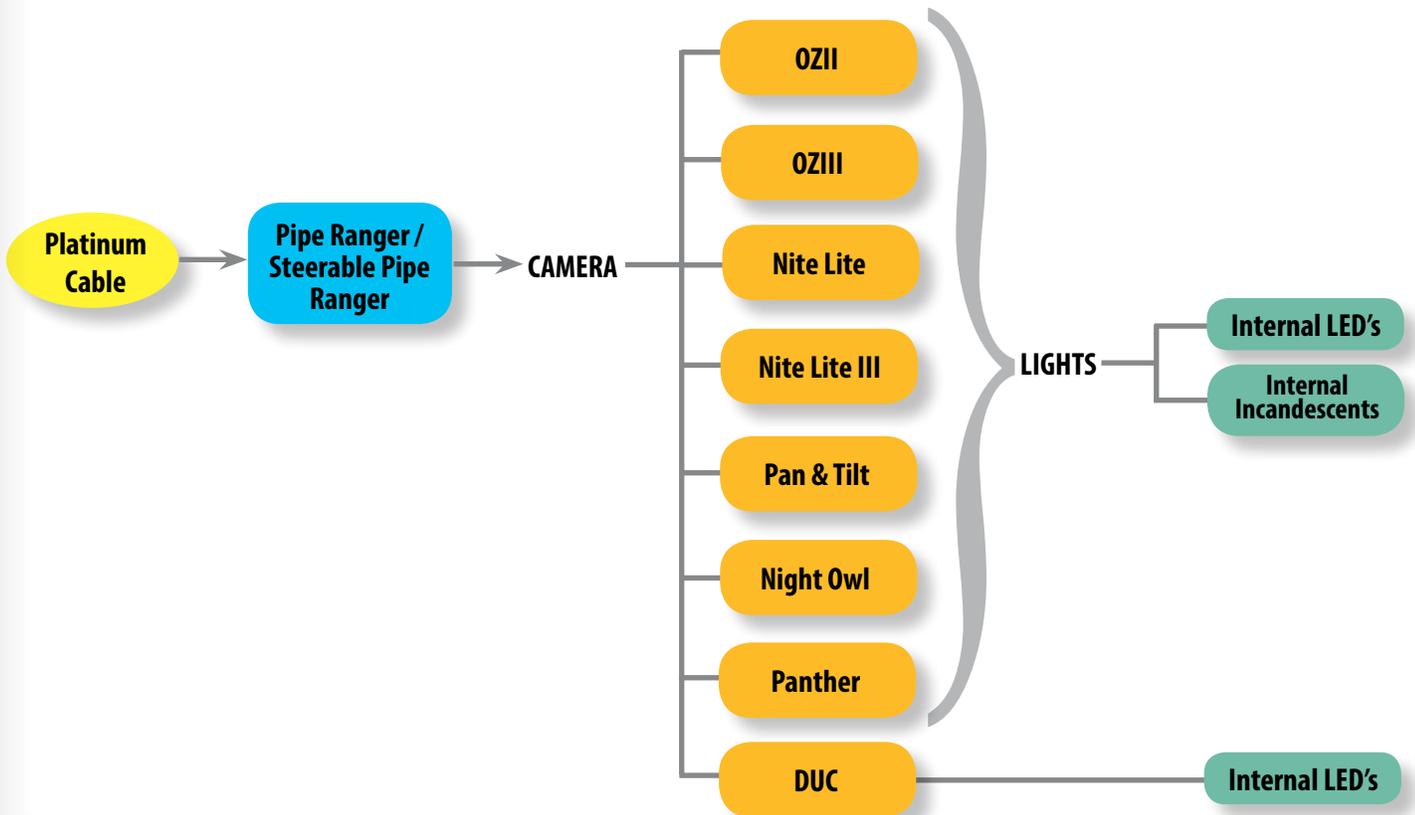


## Platinum Cable & Compact Pipe Ranger (CPR) ONLY

- Compact Pipe Ranger WM350 HI-V
- Compact Pipe Ranger WM360 60V



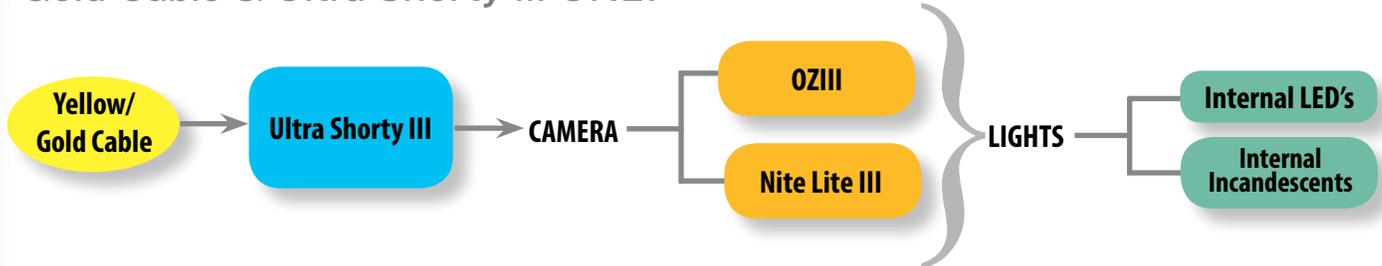
## Platinum Cable & Pipe Ranger / Steerable Pipe Ranger



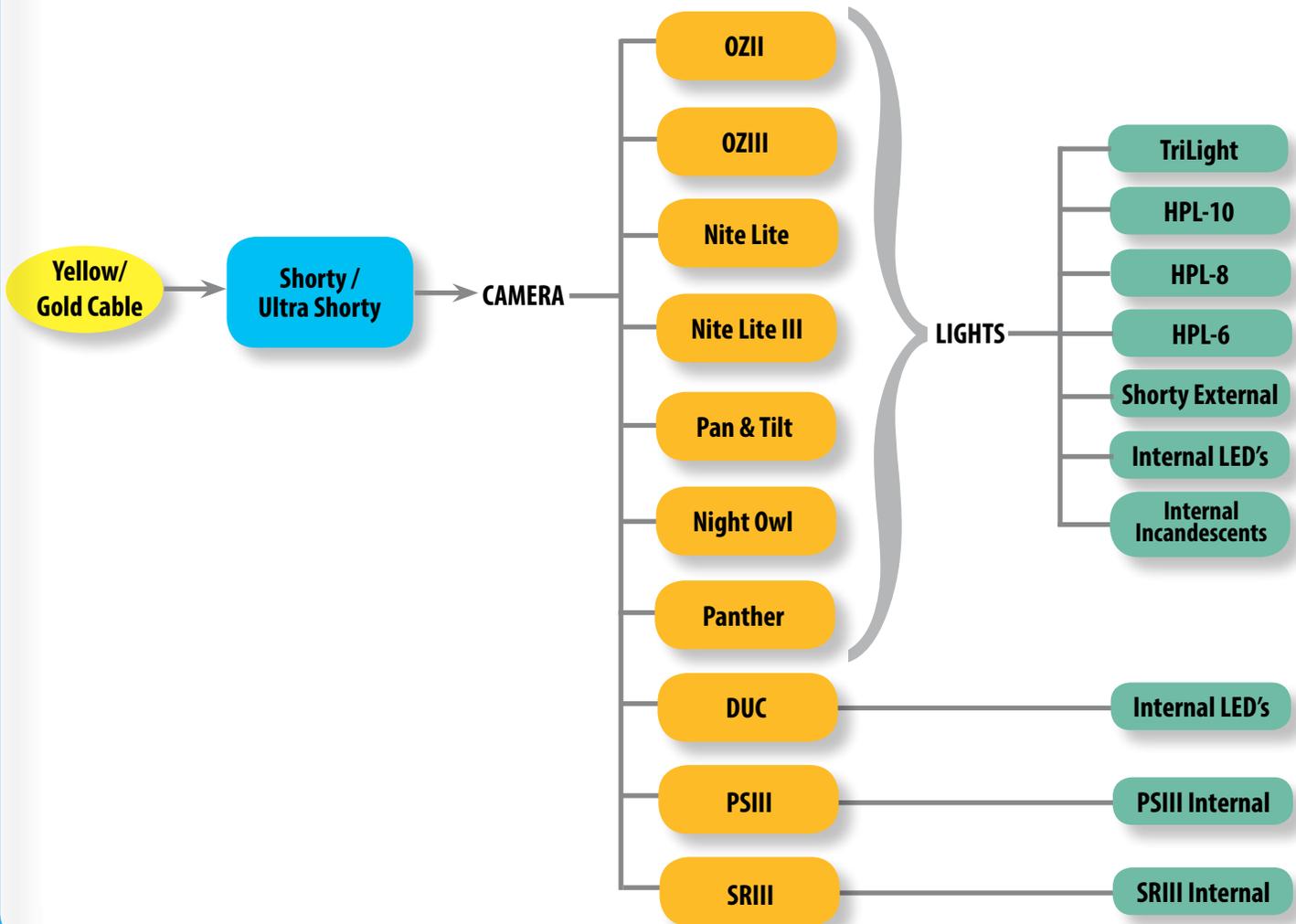


### ULTRA SHORTY SERIES *Gold Cable ONLY*

Gold Cable & Ultra Shorty III ONLY



Gold Cable & Shorty / Ultra Shorty / Ultra Shorty 21

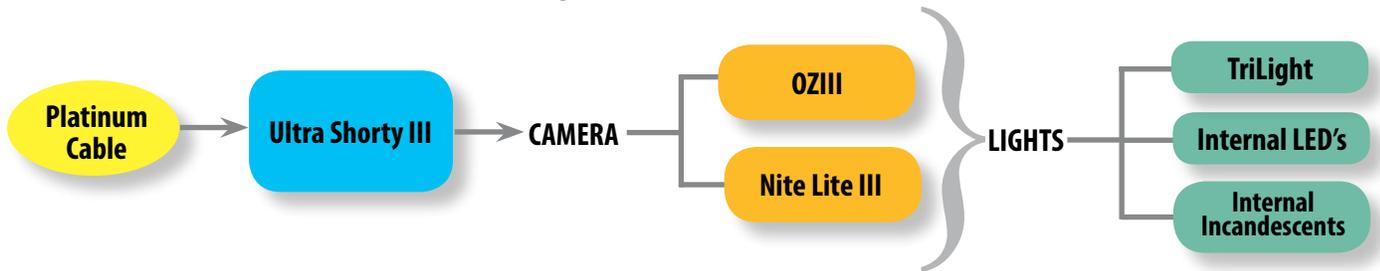




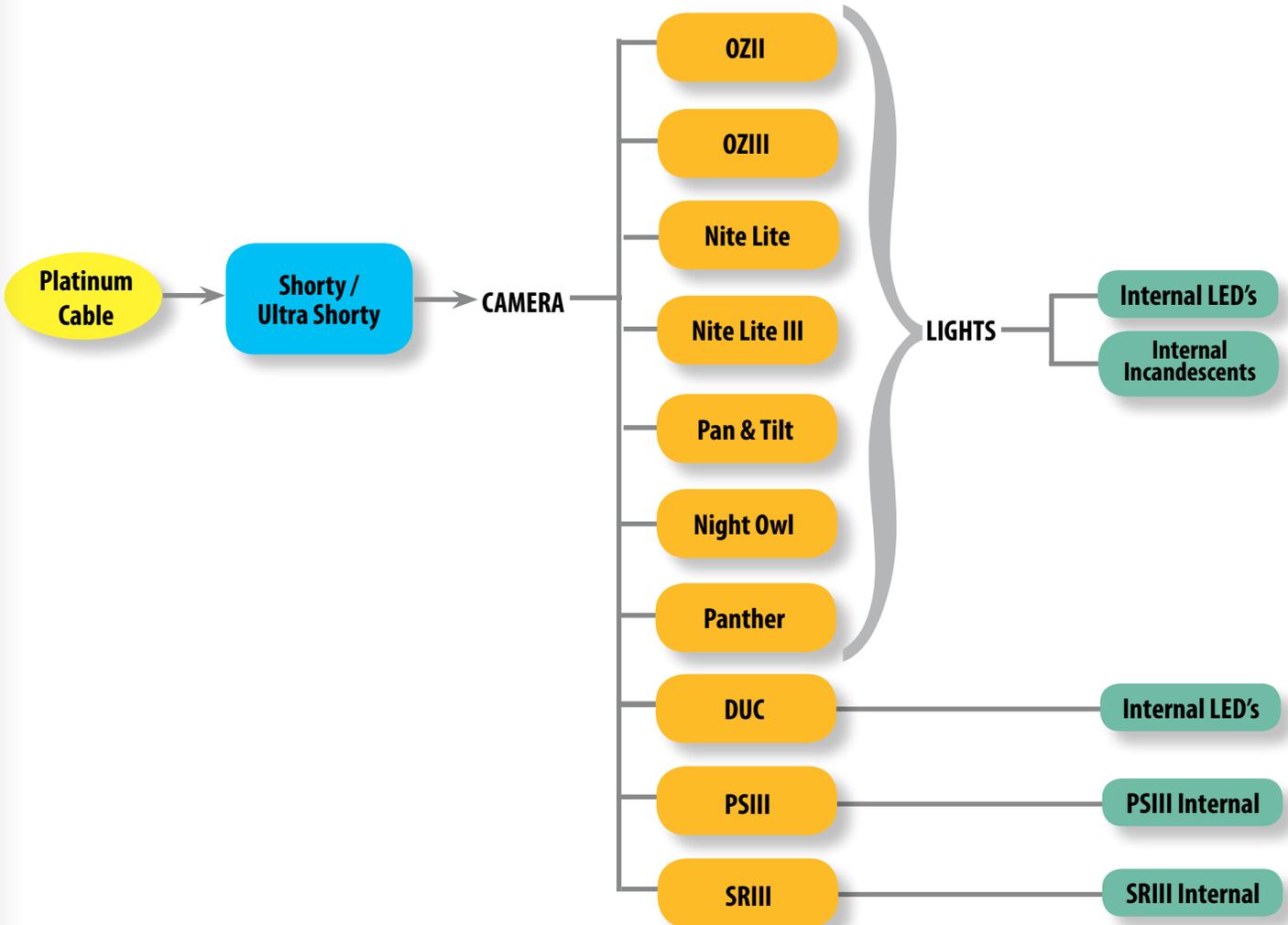
# ULTRA SHORTY SERIES

## Platinum Cable ONLY

Platinum Cable & Ultra Shorty III ONLY



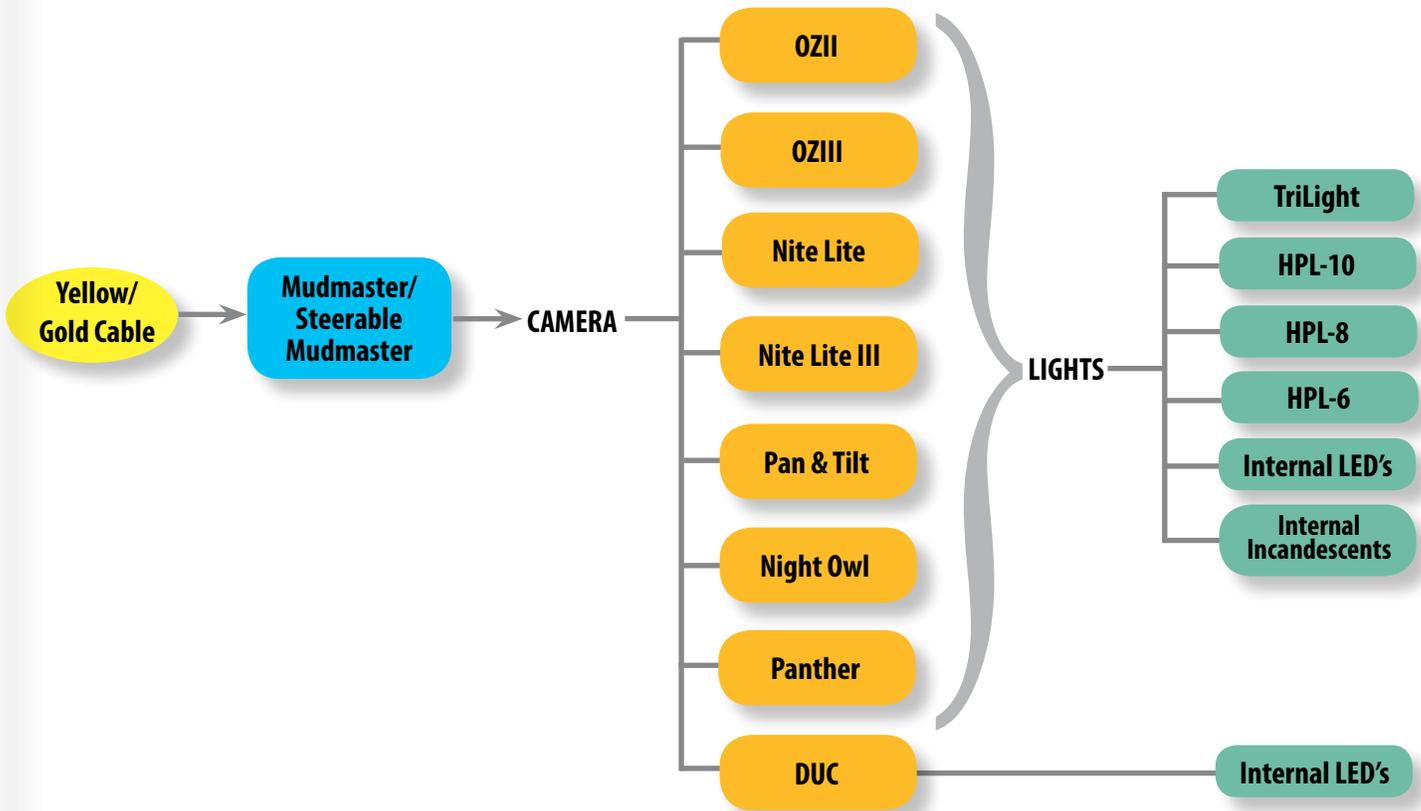
Platinum Cable & Shorty / Ultra Shorty





### MUDMASTER SERIES ONLY *Gold Cable ONLY*

#### Gold Cable & Mudmaster / Steerable Mudmaster

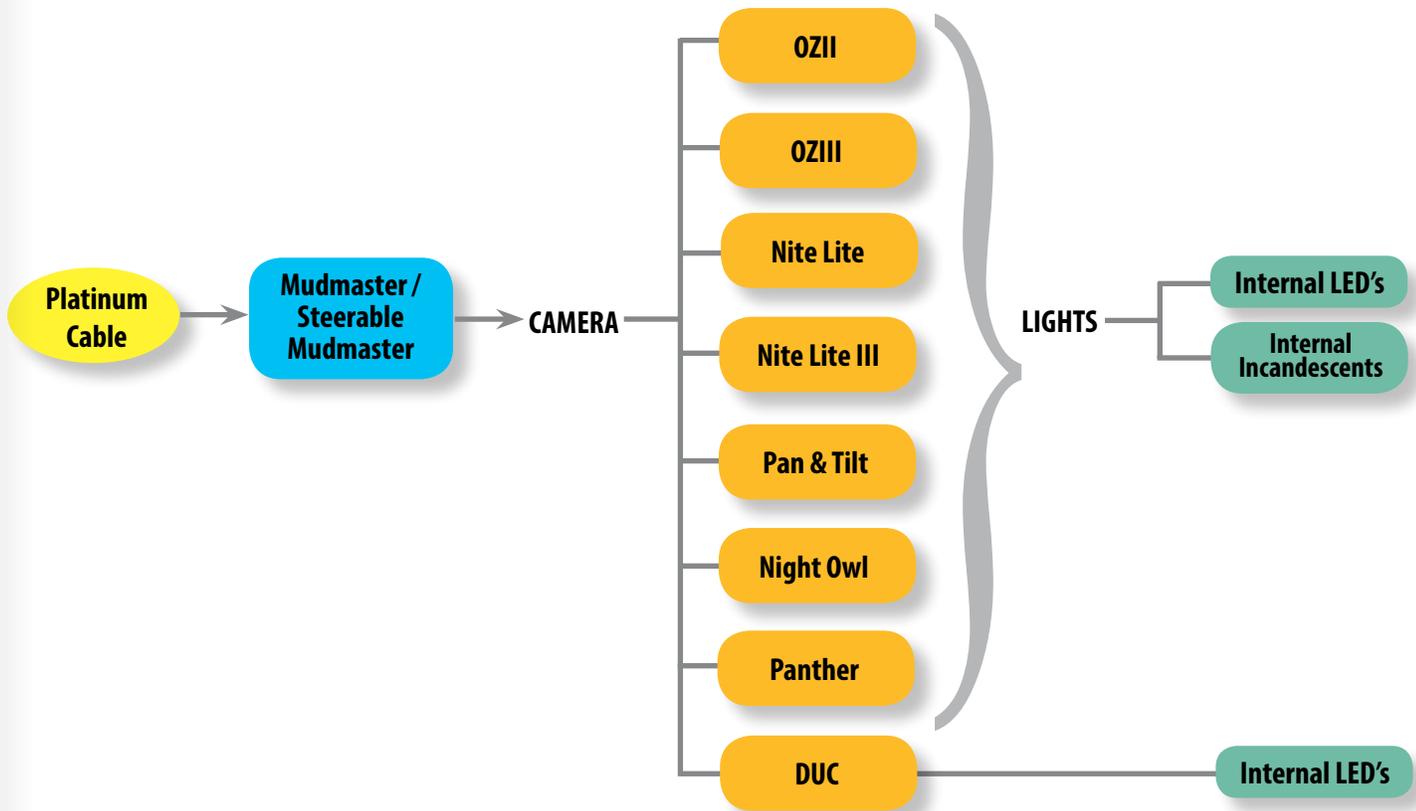


# MUDMASTER SERIES ONLY

*Platinum Cable ONLY*



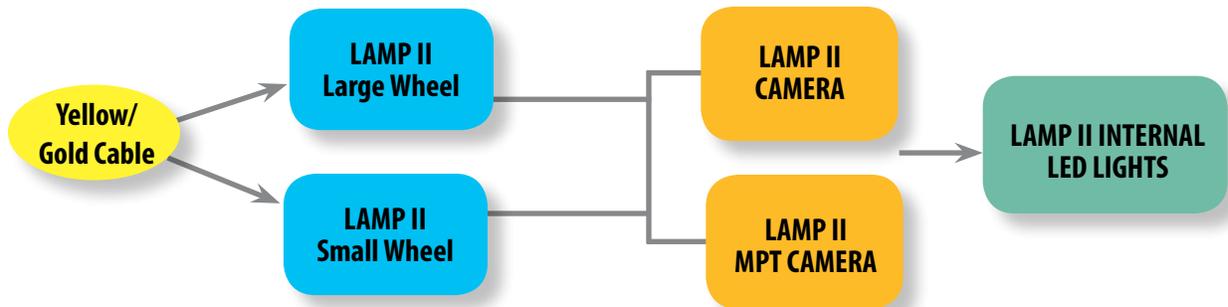
Platinum Cable Mudmaster & Steerable Mudmaster Only





### LAMP II *Gold Cable ONLY*

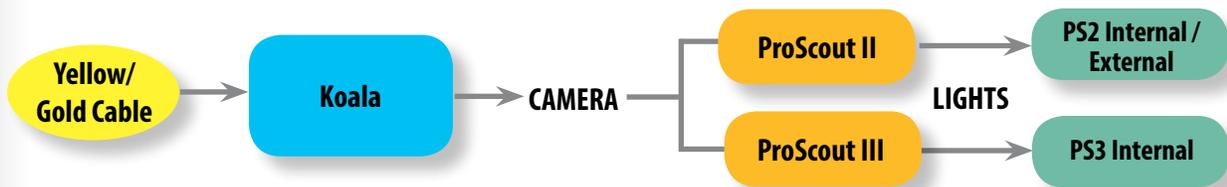
#### Gold Cable & LAMP II





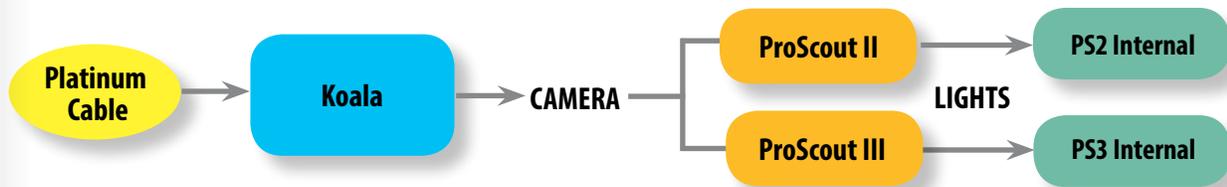
### KOALA *Gold Cable ONLY*

Gold Cable & Koala



### KOALA *Platinum Cable ONLY*

Platinum Cable & Koala



## CUES STANDARD 12 MONTH WARRANTY

CUES (“CUES”) warrants that all parts, components, and equipment manufactured by CUES shall be free from defects in material and workmanship under normal use and service for which it was intended for a period of twelve (12) months from the date of shipment of materials by CUES to the purchaser. CUES’ obligation under this warranty is limited, at CUES’ option, to replacing or repairing, free of charge, any defective materials returned, freight prepaid, to the CUES designated service facility. For all warranty claims, the materials must be returned in accordance with CUES Material Return Policy.

Major items of equipment, such as vehicles, generators, etc., furnished, but not manufactured by CUES, will be covered only under the warranty of the third party manufacturer of such equipment. Expendable parts, such as light bulbs, fuses, connectors, etc., are excluded from this warranty.

Purchaser must notify CUES of a breach of warranty not later than the last day of the warranty period; otherwise, such claims shall be deemed waived.

CUES does not warrant the materials to meet the requirements of the safety codes of any federal, state, municipal or other governmental or administrative jurisdiction. Purchaser assumes all risk and liability whatsoever resulting from the use of its products, whether used singly or in combination with other products, machines or equipment.

This Warranty shall not apply to any materials, or parts thereof, which have; (a) been repaired or altered by anyone other than CUES without CUES’ written consent; (b) been subject to misuse, abuse, negligence, accident, or damage; (c) not been installed or operated in accordance with CUES’ printed instructions, or; (d) been operated under conditions exceeding or more severe than those set forth in the specifications of design tolerance of the equipment.

THIS WARRANTY AND THE OBLIGATION AND LIABILITIES OF CUES HEREUNDER ARE EXCLUSIVE AND IN LIEU OF (AND PURCHASER HEREBY WAIVES) ALL OTHER WARRANTIES, GUARANTEES, REPRESENTATIONS, OBLIGATIONS, OR LIABILITIES, EXPRESSED OR IMPLIED, ARISING BY LAW OR OTHERWISE, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, REGARDLESS WHETHER OR NOT OCCASIONED BY CUES’ NEGLIGENCE.

CUES SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE RESULTING, DIRECTLY OR INDIRECTLY, FROM THE USE OR LOSS OF USE OF THE MATERIALS, OR FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, ECONOMIC LOSSES, LOSS OF PROFITS, LOSS OF BUSINESS, OR LOSS OF BUSINESS OPPORTUNITY. Without limiting the generality of the foregoing, this exclusion from liability embraces Purchaser’s expenses for downtime or for making up downtime, damages to property, and injury to or death of any persons.

CUES neither assumes nor authorizes any person (including employees, agents, or representatives of CUES) to assume for it any other liability, guarantee, or warranty in connection with the sale or use of the materials, and no oral agreements, warranties, or understandings exist collateral to or affecting this warranty.

This warranty shall not be extended, altered, modified, or waived except by a written instrument signed by CUES.

To ensure the orderly return of CUES products from our customers and to assure proper credit and warranty replacements handled in a timely manner, CUES has implemented a MATERIAL RETURN AUTHORIZATION (MRA) SYSTEM. Please read and follow the instructions below to ensure your MRA is handled properly and efficiently:

1. Once it is determined that a CUES product needs to be returned, call the CUES Parts Department in Orlando at 1-800-327-7791.
2. CUES will provide an MRA number by phone and ask a few questions.
3. CUES will then mail or fax the MATERIAL RETURN AUTHORIZATION (MRA) FORM with the MRA number, or include it with the replacement parts, if applicable.
4. Follow all instructions on the MRA Form. Make 2 copies - one for your records and the other will be used as a packing list.
5. Place an MRA sheet in with the parts that are shipped back to CUES along with a copy of the original packing slip or invoice, if possible. Send only the parts originally agreed upon with your Parts Representative. Any deviations/changes will require an additional MRA.
6. Make sure to include a copy of the MRA form for a packing slip.
7. Write the MRA number on the outside of the box.
8. Please take care in packing the parts that are to be shipped back to CUES. Parts must be individually protected from each other and appropriate packing material must be used to prevent damage during shipping.
9. Freight on the material returned is to be prepaid by the customer. Depending on the warranty determination, CUES, at its' option, may credit freight charges both ways.
10. The parts must be returned to CUES within 5 days of receipt of the MRA for credit to be granted.

Under normal circumstances, a warranty determination can be made within 30 days, and if under warranty, the part will be replaced at no charge. A credit will be issued if you have already received a replacement part. No credits will be issued until CUES receives the defective part.

\*\*\*\*\*NOTE\*\*\*\*\*

CUES will not warrant look-alike parts sold by competitors and reserves the right to charge a restocking fee. CUES shall not be liable for any loss or damage resulting, directly or indirectly, from the use of the materials, or for special, indirect, or consequential damages, economic losses, loss of profits, loss of business, or loss of business opportunity.

Without limiting the generality of the foregoing, this exclusion from liability embraces purchaser's expenses for downtime or for making up downtime, damages to property, and injury to or death of any persons.

CUES neither assumes nor authorizes any person (including employees, agents, or representatives of CUES) to assume for it any other liability, guarantee, or warranty in connection with the sale or use of the materials, and no oral agreements, warranties, or understandings exist collateral to or affecting this warranty. This warranty shall not be extended, altered, modified, or waived except by a written instrument signed by an authorized CUES representative.

# CUES MATERIAL RETURN AUTHORIZATION

Cust #:	Name:	Contact:	Date: 4/21/2004
Original SO #: N/A	SO Orig:	Dated:	New SO #:
S.O. To Be Credited:			
Return For:	Reason:	Territory	Prod. Ref. Cd: 51200
Orig:			
Explanation:			

Items Returned
1
2
3
4
5
6

**To ensure your MRA is handled properly and efficiently, please follow the instructions below.**

1. Ship parts back within five (5) business days of receiving your MRA number. Parts ordered in error are subject to a restocking fee.
2. Send only the parts originally agreed upon with your customer service representative. Any deviations will require an additional MRA.
3. Make a copy of this sheet and keep the original for your records. Use the copy as a packing slip.
4. Write the MRA number on the outside of the box.
5. Parts must be individually protected from each other (original packaging would be best) and appropriate packing material must be used to prevent against damage during shipping.

Note: If parts are not well protected and arrive at our facility damaged in any manner, we will automatically reject them and return them to you without credit.

**PARTS WILL BE RETURNED TO CUSTOMER AT CUSTOMER EXPENSE WITHOUT AN MRA NUMBER DOCUMENTED ON BOX. CUES IS NOT RESPONSIBLE FOR SHIPMENT FROM CUSTOMER TO CUES.**

Use this section as a Packing Slip.

**Please remember to write the MRA number on the box.**

**MRA #:**  
XXXX

**Return To:**

Cues  
 3600 Rio Vista Avenue  
 Orlando, Fl. 32805  
 (407) 849-0190  
 FAX (407) 425-1569  
 WATS 800-327-7791

At CUES, we realize your return on investment is directly related to daily production in the field. By stocking the largest inventory of OEM equipment in our industry, CUES strives to ship all parts orders on the same day or within 24 hours after receipt of the order.

Whether you need a camera or a fuse, CUES will quickly process and ship your order in accordance with your schedule requirements! Our experienced parts professionals can help you with parts identification, shipping methods, equipment operation questions, and connect you to the correct specialist for troubleshooting!

CUES offers four convenient stocking locations that contain a large assortment of parts, finished products, portable, and truck mounted systems. Texas, Arizona, Oklahoma and Louisiana customers can be serviced by our local dealerships. Contact us at your most convenient stocking location! For authorized dealer locations, log onto our website at [www.cuesinc.com](http://www.cuesinc.com).

Parts can be ordered via phone or facsimile! For operating hours, contact information, and locations, log onto our website at [www.cuesinc.com](http://www.cuesinc.com). Contact us at your most convenient stocking location! Log onto our website at [www.cuesinc.com](http://www.cuesinc.com) to view the CUES Parts Department & Dealers hours & locations.

CUES Parts Department: Parts turnaround is normally within 24 hours after receipt of order. Please note that special shipping arrangements can be made at the time of the order. All return shipments received at CUES freight collect will be refused upon delivery unless previously authorized by CUES personnel. Normal operating hours are 8am to 5pm, EST., Phone: 800-327-7791, Fax: 800-831-1184.

CUES Service Depot: Service turnaround is normally 72 hours or less upon receipt at our depot, excluding weekends and holidays. All return shipments received at CUES freight collect will be refused upon delivery unless previously authorized by CUES personnel. Normal operating hours are 8am to 5pm, EST., Phone: 800-327-7791.

### *West Coast*

**For West Coast Customers:**

The parts and service depot is located at 1943 S. Augusta Court, Ontario, CA, 91761. Normal operating hours are 8am to 5pm, PST  
Phone: 800-544-8695

### *Canada*

**For Canadian Customers:**

The parts and service depot is located at 1675 Sismet Road, Unit 2 & 3, Mississauga, Ontario L4W1P9  
Phone: 905-238-9178

### *Midwest*

**CUES Midwest:**

[www.cuesmidwest.com](http://www.cuesmidwest.com)  
2325 Parklawn Drive, Suite K  
Waukesha, WI 53186  
Phone: 262-717-3165  
Fax: 262-717-3167

## SAFETY PRECAUTIONS

Precautions must always be taken when operating electronic equipment. Exposed wires, damaged equipment, or improper operation can lead to a dangerous situation.

Please take a few minutes and read this entire manual prior to operating the equipment. Follow all safety procedures and thoroughly inspect equipment prior to use each day. This will help the equipment retain its full value and will reduce the risk of injury, property, and/or equipment damage.



- Read the entire manual before attempting to connect or operate any equipment.
- Connect and disconnect cables only when the electric power is turned OFF.
- Never remove protection covers from the equipment or power generator. Internal repairs should only be done by an authorized CUES technician.
- If using a portable generator, always place it in an open area away from other equipment, manholes or obstructions prior to start-up; do not use a portable generator in an enclosed area.
- Upon receipt of the equipment, check for visible damage. If there is any evidence of rough handling, if damage is found, or if any equipment is missing, please contact the CUES Customer Service at 1-800-327-7791.

## PERSONAL SAFETY EQUIPMENT & TRAINING

CUES stresses the use of appropriate safety equipment while working in and around manholes and during system operation. Safety should constantly remain the utmost priority. NOTE: The user of CUES products is responsible for all training and operation under federal, state and local guidelines and regulations for both confined space entry and traffic control. Recommended safety equipment includes but is not limited to the following:

- Safety goggles
- Work gloves
- Steel-toed boots
- Reflective vests
- Hard hats
- Filter masks (full respirators may be necessary)
- Flashlights
- Safety lines
- Traffic warning signs
- Traffic cones
- Gas detectors
- Ventilation fans

***CUES @ makes no warranty for the use of its products and assumes no responsibility for any errors or omissions in this document or for incidental or consequential damages resulting from misuse of the products.***

This Record of Revision page is designed to allow the manual user to determine the engineering/manufacturing level to which the manual is written. As engineering changes to this hardware are made at CUES, necessary information in the manual will be revised to reflect those changes. The latest change level and the rationale for any change(s) will be explained in tabular format on this page to allow the manual user to be better equipped should the need arise to call CUES regarding technical information.

Original Manual	Revision	Change Description
K2 SERIES	010107	Initial preliminary release
	020107	Added equipment configurations
	081407	Added various equipment screen instructions
	050508	Added CREATING AN INSPECTION REPORT procedure
	070208	Manual updated to current design requirements
	013009	Added K2 observation codes
	063009	Manual updated to current design requirements
	012910	Updated with single conductor instructions; also added K2 keycode information
	031910	Corrected PACP codes
	111010	Updated to current R017 revision
	043011	Updated to current R020 revision
	082411	Updated to current R022 revision
	050112	Updated to current R025 revision
	013113	Updated to current R029 revision
	060713	Additional changes required for R029
	082713	Updated to current R030 revision
	092013	Updated to current R031 revision
	112213	Updated to current R032 revision
	062615	Updated to current R035 revision
	020116	Updated to current R036 revision - removed single conductor version
050116	Removed software portion, which is now a separate manual, P/N MK901	
082016	Updated the Logitech Gamepad Instructions on pg7	
040120	Updated instructions to include the CURRAHEE CUTTER and Micro Pan & Tilt Camera	
080120	Updated the K2/K3 Screen Operations to current.	

# Innovation for over **50** Years

**CUES** is the world's leading manufacturer of closed circuit television video (CCTV) inspection, rehabilitation, pipe profiling equipment and asset inspection/decision support software. For over 50 years, **CUES** has provided innovative pipeline inspection technology and solutions to enable accurate condition assessment and proactive maintenance programs for buried infrastructure.

In addition to inspection equipment, **CUES** also designs, manufactures, and sells a broad range of pipeline rehabilitation and profiling equipment. These include chemical grouting systems for sewer line pipe joints capable of using a wide variety of grouting products. **CUES** also manufactures lateral reinstatement cutting systems which enable the reinstating of laterals in mainline sewers after they have been relined with any of a wide variety of liner materials. Pipe profiling is accomplished via Laser for Sonar based systems.

**CUES** has the most locations and dealers available to serve you! To find a local **CUES** facility, find the operating hours for a particular location, or to contact us at your most convenient stocking location, please log onto our website at [www.cuesinc.com](http://www.cuesinc.com) or call the **CUES** Corporate Headquarters in Orlando, Florida for more information.